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MOPTOWN  
HOTEL

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Teacher's Guide

Pat Neu



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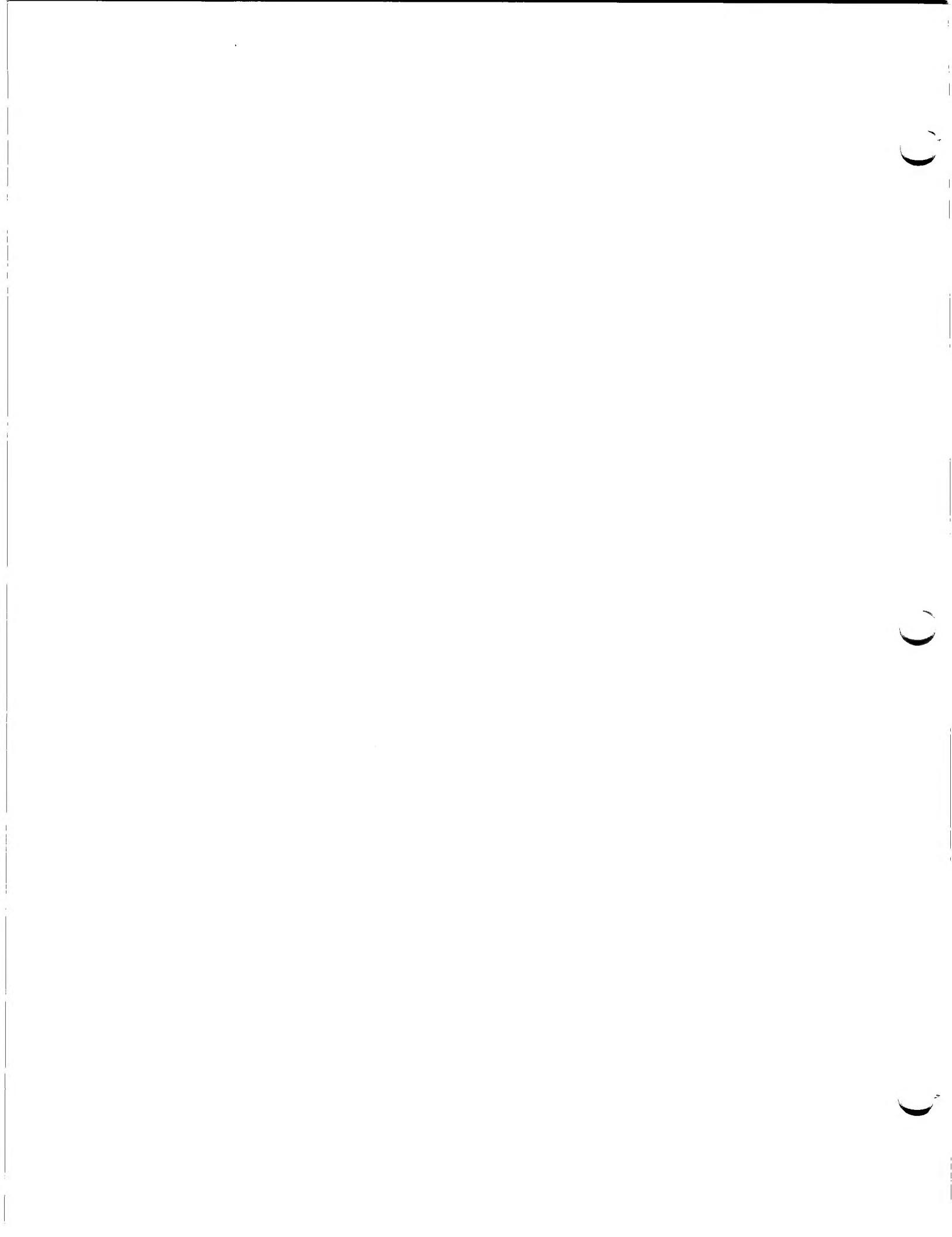
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## **Preface**

This manual is designed to meet the needs of teachers who wish to introduce MOPTOWN HOTEL to their students. Below is a description of the sections in the manual.

**Teaching with Computers** addresses several issues of concern to teachers. Here topics such as the teacher's role, setting up the work-space, and incorporating the computer into the curriculum are discussed.

**Stepping Through Moptown Hotel** provides an overview of the concepts and skills which can be developed by playing MOPTOWN HOTEL. The Learning List enumerates these for each game. This section is designed to help the teacher prepare to introduce the program to students. It may be used without a computer for those teachers who prepare their lessons at home and do not have a computer available. Each section of the software program is presented with a focus on objectives, on-line presentation, and off-line activities. The off-line activities are intended to strengthen and generalize the concepts and skills developed in each tutorial.

**Keeping Current** gives the names of valuable books, publications, and organizations that are national in scope and can help the teacher who wishes to learn more about computers and the educational applications of computers.

The **Glossary** presents terms that are important in this program.

**Special Keys** provides a quick reference to the keys needed to play MOPTOWN HOTEL.

It is our hope that this manual meets the needs of teachers who use it, and we welcome suggestions, comments, and ideas about its effectiveness.



# Teaching with Computers

## A Teacher's Role

With increasing numbers of computers in schools, we find ourselves asking how we can effectively use a new teaching tool in the classroom. What is the role of the teacher who uses computers?

Your role as a teacher is critical in a student's computer experience. You can open exciting doors of learning by selecting software that challenges students while providing them with ample opportunities for success. You can help students create bridges between computer skills and concepts, and the classroom curriculum. You can be a role model demonstrating openness and curiosity while introducing new ways to learn.

Today many young people have computers at home, and you may find that some of them are skilled users. If you are just learning about computers yourself, you may find that some of your students are more knowledgeable about the use of computers. You can harness this expertise and provide your computer-literate students with the chance to help you and other students learn about computers. By doing this you can give these students the gift of heightened self-esteem while gaining valuable assistants in your role as the classroom manager.

You will find that most children welcome the opportunity to use a computer. Most will quickly pick up terms and procedures. With a little guidance, they all can become competent computer users.

Your role in integrating the computer in your classroom is much the same as it is when introducing any other learning tool. Once the tool is selected, you must prepare to use it. Then you help your students gain mastery. Your challenge becomes one of using the new learning tool in a creative and productive way. It takes the same amount of time and planning that goes into developing any new course and selecting the curriculum materials.

When students, especially younger ones, begin to use a computer, they will often need help with directions. You can provide those directions to the entire class, to groups, or to individuals. Once the students master basic directions, they can work alone or in groups. Children learn a great deal from working with other children. You should encourage them to share information.

In many ways, you can view the computer as a superb teacher's aide. With the right kind of software, children can feel safe taking

intellectual risks. Skills and concepts can be introduced that traditionally would not be taught until much higher grades. Enrichment opportunities can be provided for any student.

Although the computer is a powerful tool for learning, it can never replace human creativity and sensitivity. The computer cannot know the skills that each of your students needs to master; nor can it know students' strengths and weaknesses. Only you, the creative teacher, can choose the software that will benefit your students, assign needed lessons, and make the critical subjective judgments about approach that will turn the key and free a student's mind to learn.

## **Hardware Management**

**Setting Up Space: Create a Work Station** Your school or classroom may be one in which a computer is already established. If so, this section may not pertain to you. However, if you are introducing a computer to your students, the following suggestions may help.

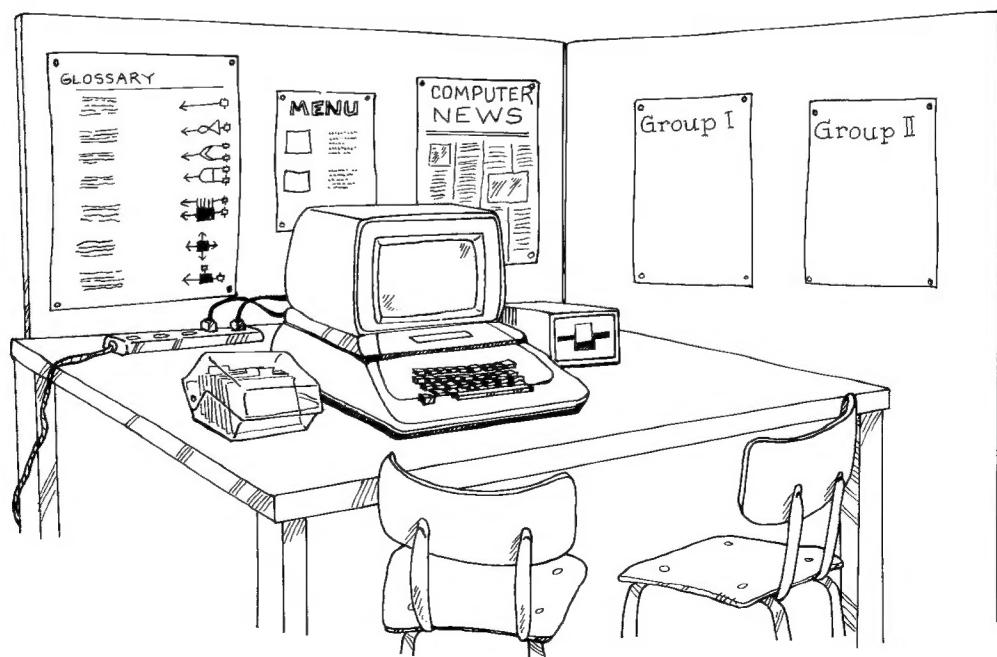
Introducing a computer to your students will probably be an exciting experience for everyone. Set aside a special place where students can explore and use the computer. It can be a place where they learn to care for the computer without fear of damaging an expensive machine. It can provide a place to focus on computer work and a place to display materials related to the concepts and skills presented by the computer programs.

Computer work stations may have the following things in common: an enclosed computer table (the enclosure provides display space); enough chairs for groups of students; and room for the entire class to sit on the floor and view the computer screen.

To set up a work station, you will need the following items:

- *A table.* If your computer is not on a portable cart, a table will be needed. It may be small enough to hold just one computer or large enough to hold more. It might have space for another student who is waiting for a turn at the computer.
- *The computer system(s).* For each system you will need a computer, a disk drive, and a color monitor; a power strip (power bus) with an on/off switch is suggested.

- *A container to hold the disks.* You can purchase special disk holders at computer stores or at some educational supply houses. A covered box works almost as well if disks can stand up inside it.
- *Some way of enclosing the space.* Placing the work station in a corner of the room is an easy solution. If you don't have an extra corner, you can construct a three-part standing screen by using fiber board, heavy cardboard (even refrigerator cartons), or wood. If you choose fiber board or wood, you will need hinging devices. If you use heavy cardboard, you will need reinforcements on the bottom to make it stand upright. An alternative could be to turn the screen away from the view of the classroom.
- *Display space.* You can hang bulletin boards right on the walls if your work station is in a corner. A wooden enclosure can be covered with cork or fiber board. If you use fiber board or heavy cardboard for your work station, you can display materials directly on the station's enclosing walls.
- *Materials for working on the bulletin board.* Pens, pencils, paper, erasers, pushpins, tape, string, and containers to hold such materials are items to consider. You should place these items distant from the computer or make them unavailable to students to avoid tempting them to experiment with the keyboard.



**Setting Up the Computer** Setting up the computer can become a classroom adventure. In our experience, even young children can become competent at setting up and taking down computer systems. In fact, we know of some classrooms where the children instruct the teachers.

Discuss ahead of time your ground rules for using the computer. (No food or drinks around it; use it gently; do not put anything into or on the computer, etc.) Warn students that items such as food, paint, clay, magnets, paper clips, or any liquid that might spill into the computer can cause damage to the computer unit. You may even want to have a guest speaker discuss these issues and answer students' questions.

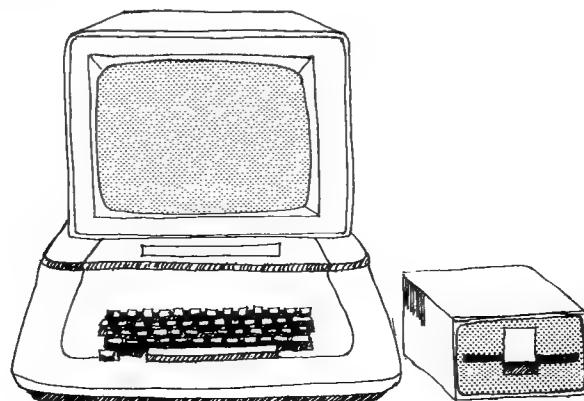
The manual that comes with your computer will explain the details of how to set up your specific machine. However, we are including some tips learned over time.

- *Ground your computer.* Computers have three-prong plugs and must be plugged into a wall socket that is actually grounded. Some older buildings do not have proper grounding, so have your custodian check this.
- *Use a power strip with an on/off switch.* Instead of plugging your computer directly into the wall socket, consider using a power strip. It has multiple sockets and can compensate somewhat for lack of sufficient electrical outlets. It serves the purpose of an extension cord, but is sturdier. Using the on/off switch on the power strip to turn the computer on and off can reduce wear and tear on the computer's power switch.
- *If you are using a television, you will need a frequency modulator.* Frequency modulators to convert the TV into a computer monitor are inexpensive at computer supply stores. They attach to the TV's antenna leads and, by a cable, to the computer. See the instructions that come with the frequency modulator. Regular monitors do not need frequency modulators.
- *Open up your computer.* You can do this with most, but not all, computers. Look inside. This is a good time to introduce your students to computer terminology. They can see the silicon chips. The large board that everything else is plugged into is called the mother board. The disk drive has a peripheral card that is plugged into a specific slot. There is also a special port for a joystick if you will be using one. See your machine manuals.

- *Handle disks with care.* Hold disks only by the label or by the black jacket and teach your students to do the same. Disks can be damaged easily by pressure (writing on the affixed label with pen or pencil), heat (sunlight, heaters, storage areas), magnetic fields (magnets, paper clips stored in magnetic containers, being placed on or around disk drives, telephones, fans, motors, loudspeakers, or air conditioners), or bending.
- *Cover your computer.* The computer hardware may need special attention, too. Large plastic or cloth sheets may be used to cover the computer to protect it from dust when not in use.

Tell students that *starting-up* means putting the disk into the disk drive, closing the door, and starting the computer. This is the proper order for Apple computers. For the Atari, turn on the disk drive first. Explain to students that to put the disk into the disk drive, they must slide it gently until it stops. Jamming it roughly or pushing it in too far can result in a damaged disk. When one of the two red lights goes out, insert the disk. Close the disk drive. Turn on the computer and the monitor. The disk drive may make a whirring or clicking sound as it is loading. A red light on the disk drive will light until the loading is finished. Tell students the red light is like a stop sign; do not open the door to remove a disk or to put another one in when the light is on.

You can explain to your students that the disk is spinning very fast inside the disk drive. Heads in the disk drive resemble those on a tape recorder and they read the disk's information. The information travels through the wide cable running from the disk drive to the computer and is stored there in RAM (random access memory) chips. You can see these in the Apple II computer. Ask students to keep the doors to the disk drives closed when not in use; this keeps the heads from getting dirty.



## Classroom Management Tips

Here are a few tips that we have found useful for classrooms presentations.

**One Computer: Everyone Plays** At the present, most classrooms have only one computer. In fact, the teacher who has access to one computer that does not need to be shared is considered quite fortunate. How to manage this resource is of some concern.

Computer programs work very well in classroom presentations. The main limitation is having a large enough screen so that everyone can see. When teachers introduce the programs to the entire class at the same time, students know what to expect and have a better idea of what they need to do when they work individually at the computer. One presentation that works well is to have students take turns running the programs and playing the games as the rest of the class watch and advise.

One of the games, "Moptown Hotel," is a two-player game. Here the class may be divided into two teams. Choose team names. Members of each team alternate turns trying to put a Moppet in the hotel according to the rules. In "Secret Pal" players may keep track of how many guesses a team uses to find the Secret Moppet, and in "Moptown Map" and "Whose Birthday?" teams can compare their percentage scores or number of presents earned at the end of the games.

As you work with your class, you will discover new ways to encourage student involvement. The students will make interesting suggestions as well.

**Two at the Computer: Parallel Play** Another way to manage a classroom presentation is to have one or two students playing the game at the computer while the rest of the class are involved in an off-line activity. With shorter games, all of the students may have an opportunity for a brief time at the computer during one class presentation. Some of the activities in this book are suggested off-line activities. They can be used to extend the concepts developed in the computer games.

# Stepping Through Moptyown Hotel

The following sections provide detailed descriptions of the games as well as specific suggestions for how you can present them to your class. There are also reduced copies of the student activity pages, which have been designed to expand the concepts and skills introduced in the games.

You can use these activities in several ways: as introductory exercises or as off-line activities for students to do at their desks while other students use the computer; as follow-up activities after all the students have played the computer games; or as homework or evaluation. Feel free to experiment using the activities in different ways to discover how they are most valuable to you.

Note that the games in MOPTOWN HOTEL are carefully sequenced and cover a broad range of skills development. The activities are also sequenced. You will want to be sensitive to your students' skill level as you use these materials. For example, one of the off-line activities introduces students to the concept of an analogy and could be completed by younger students. Later activities would be more appropriate for students with independent reading and writing skills. You may find that activities that seem too advanced or too simple for your students may be appropriate with minor modifications.

## Learning and the MOPTOWN HOTEL Courseware

MOPTOWN HOTEL provides seven playful, progressive games to help students develop organized and flexible thinking skills using arrays, analogies, negative clues, controlled variables, inferences, and strategy in problem solving. It provides an entertaining context to use these skills for playing games according to the rules of the Moptyown Village.

Analogies require a specialized skill in classification and are a critical element of reading comprehension, expository and creative writing, poetry, public speaking, and other communications skills which require a connection between the familiar and the unfamiliar. Using negative information, finding solutions within given constraints, making inferences, and discovering patterns in arrays also help students learn to organize information. The final game in this program, "Moptyown Hotel," requires the student not only to use organized thinking but to plan future moves and use blocking strategies. These are critical skills for decision-making in math, science, and social studies.

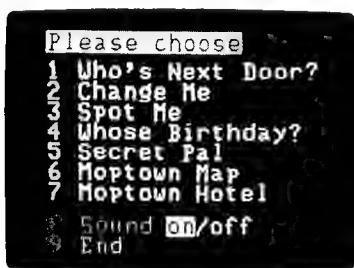
## Stepping Through Moptown Hotel

A student who has successfully played MOPTOWN HOTEL can gain new skills and confidence in problem solving. Students of any ability level, including both gifted students and those with learning disabilities, can make tremendous gains when trained to use organized thinking skills to arrange information in patterns and arrays.

### **The Learning List**

#### **Games**

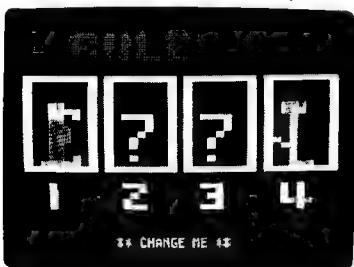
#### **1 Who's Next Door?**



#### **Concepts and Skills Presented**

- Using arrays.
- Developing analogous relationships.
- Using classification skills.
- Using problem-solving skills.

#### **2 Change Me**



- Controlling variables.
- Planning ahead.
- Using problem-solving skills.

#### **3 Spot Me**



- Analyzing traits.
- Recognizing variables.
- Using inference to find the greatest difference.
- Using problem-solving skills.

4 Whose Birthday?



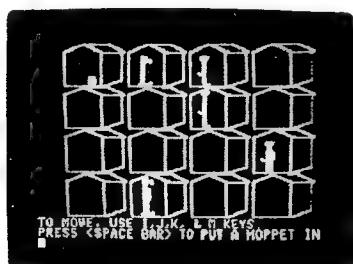
- Using negative information.
- Identifying traits.
- Selecting variables.
- Using problem-solving skills.

5 Secret Pal



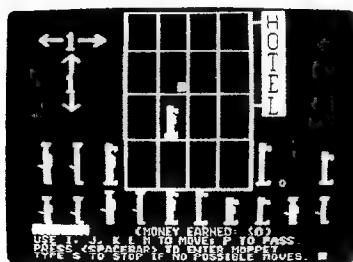
- Identifying traits.
- Keeping variables constant.
- Inventing strategies.
- Making inferences.
- Using problem-solving skills.

6 Moptown Map



- Using arrays to arrange information.
- Controlling variables.
- Using double sorting.
- Making inferences.
- Using problem-solving skills.

7 Moptown Hotel



- Controlling variables.
- Using simultaneous sorting.
- Planning ahead.
- Developing strategies for problem solving.

## **Starting Up the Program**

First make sure that all your students can see the screen and, if possible, the computer keyboard. Then choose one student to put the disk in the disk drive and turn on the computer. If you are using an Apple IIe computer, be sure the **CAPS LOCK** key is down.

After the opening picture, the menu, which lists the game titles from 1 to 7, appears on the screen. Games are selected by pressing the appropriate number key on the keyboard.

Number 8 on the menu is the sound option. By pressing **8**, the white box can be moved from ON to OFF and back again. Most students enjoy the sound that accompanies the game, but if noise is a problem in your classroom, ask a student to turn the sound off.

NOTE: The sound can be turned on or off only at the time the menu is displayed. It cannot be changed when a game is in progress.

Turning off the sound is not an option for Atari computers; however, the sound control on the monitor may be used.

To select a game, ask a student to press the appropriate number on the keyboard. The red light on the disk drive will come on and the disk drive will make a whirring sound. Explain to your students that the computer is now reading the game from the disk where it is stored and putting it into its memory so the game can be played. It is helpful for the students to imagine the computer as an empty brain and the disk as a book. The disk drive helps the computer read the book so that it knows how the game is played. This process is called starting up the program. Once the computer is turned off, it forgets everything about the game and you need to load the program again to play the game.

Warn your students never to touch the disk when the red light is on. This could damage the disk as well as the disk drive.

Your students should know about two important keys that work the same way in all the MOPTOWN HOTEL games.

**ESC**      STOPS A GAME

**SHIFT** - **?**      RETURNS TO INSTRUCTIONS

Point out the location of these keys on the keyboard. You may wish to explain their use now, or wait until the information is needed during game play.

In most places in the games, students can stop the game by pressing **ESC**, the "escape" key. When they do, they will be asked if they want to stop. Pressing **N** for *no* will return them to the game. Pressing **Y** for *yes* will return them to the menu where they can press a number to select another game, or they can press **9** to stop playing MOPTOWN HOTEL.

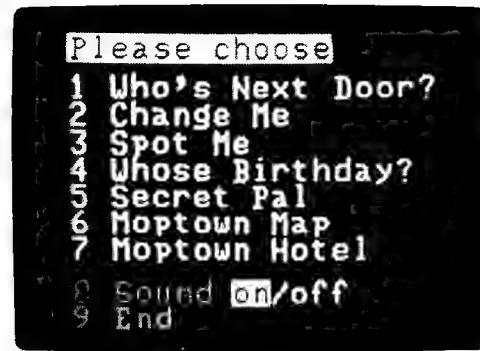
In most places in the games, students can see the instructions by pressing **?**. On most keyboards, the **SHIFT** key must be held down while the **?** is being pressed. The instructions can be helpful if the students have forgotten how to play the game.

When the program stops loading, the title picture for the selected MOPTOWN HOTEL game appears on the screen and students have an opportunity to see the instructions. The instructions explain how the game is played and which special keys players will need to use. Now is a good time for student questions. Once students know how to play, they can skip the instructions and start the game by pressing **N** for *no* when they see the question WOULD YOU LIKE INSTRUCTIONS? (Y OR N). This moves them directly into the game.

# 1 Who's Next Door?

## Objectives

- Using arrays.
- Developing analogous relationships.
- Using classification skills.
- Using problem-solving skills.



This game is an analogy game. Analogies, which are often used to introduce new ideas or relationships, express a parallel relationship between pairs of objects in different categories. For example, "a hat is to your head as a shoe is to your foot" expresses how the relationship between *hat* and *head* is parallel to the relationship between *shoe* and *foot*. To understand analogies and to use them successfully, students need to understand that *head* and *foot* are both in the same category (body parts) and that *hat* and *shoe* are both in another category (something we wear). Other analogies of this type could include "a hat is to your head as a belt is to your waist" and "a scarf is to your neck as a shoe is to your foot." "Who's Next Door?" uses a  $2 \times 2$  array to demonstrate these analogies to students.

## On-Line Presentation

Before introducing "Who's Next Door?" at the computer, check your students' understanding of classifications. Can they recognize common features of pictures or objects in a group? Can they sort a group of objects by color? By size? By function? Students need to be able to recognize many types of classification before they are able to develop a complete understanding of analogies and analogous relationships. Encourage students to start a collection of analogies on the bulletin board or in a book.

You may want to introduce students to the Moppets and their parts by having them do the first off-line activity (Computer Chart) before playing the game. If you also want to introduce them to the principle of the game at this time, make a transparency of the activity sheet for the second activity, What's Missing?, and use it with an overhead projector to play the game with the class.

After the program has been loaded and the menu appears on the screen, ask a student to press **I** on the keyboard to load the first game, "Who's Next Door?" The game begins with a display of an incomplete game box. The questions WHO LIVES NEXT DOOR TO THE BIBBIT? and WOULD YOU LIKE INSTRUCTIONS? (Y OR N) appear on the screen below the box. Ask one student to sit at the computer while the class reviews the instructions. Have the student answer the second question on the screen by pressing **Y** for yes. (Later, students can skip the instructions and start the game by pressing **N** for no.)

The instructions explain the principle of the game, giving a sample problem and solution. Read the instructions aloud and review them with students. When discussing the first screen, emphasize that although the first Moppet is tall and the second is short, all their other traits are the same. Then have the student press **RETURN**. For the next screen, discuss the traits of the third Moppet and read the instructions which appear on the screen.

Ask students to identify the traits of the third Moppet and suggest the trait to change in order to predict which Moppet goes in the empty room. Then have the student at the computer press **RETURN** to see the solution. The fourth Moppet will have three traits in common with the third, but it will be short instead of tall. Be sure students understand that this is the same relationship that exists between the first two Moppets. Answer any questions students have and then have the student at the computer press **RETURN** to start the game.

**Playing the Game** Choose one student to play the game at the computer while the rest of the class watch and advise. A  $2 \times 2$  array with Moppets in three of the squares will appear on the screen.

Students can take turns telling the computer operator which trait is correct. As students play, discuss the following points:

- Players select a trait by pressing the key of the first letter of the desired trait.
- Players must change the *same* trait that was changed in the rooms upstairs to find out who lives in the empty room downstairs.
- Players must select all four traits for the Moppet before it will appear on the screen.

After the class presentation, pairs of students can take turns playing the game at the computer. At the same time, the other students in the class can be involved in off-line activities.

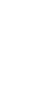
## **Off-Line Activities**

**COMPUTER CHART** This activity is an introduction to the Moppet traits.

You need:

- An activity sheet (page 1) for each student.
- Colored pencils, pens, or crayons.

Discuss the Moppet traits with students as they color the chart. They can use any colors, except on the red and blue Moppets. Have students keep their charts to bring with them to the computer or to refer to when they are doing off-line activities. They can mount them on tagboard and cover them with clear plastic to make them last longer. You may want to post one of these charts near the computer.

Computer Chart		NAME
<b>Moppet Characteristics</b>		
Color this chart and post it near the computer.		
	Tall <input type="text" value="T"/>	
	Fat <input type="text" value="F"/>	
	Short <input type="text" value="S"/>	
	Thin <input type="text" value="T"/>	

**WHAT'S MISSING?** The activity sheets for this activity require students to complete analogies using Moppets, geometric shapes, words, and numbers.

You need:

- An activity sheet (page 2, 4, 6, or 7) for each student.
- A set of Moppet cards (page 3) for each student.
- A set of shape cards (page 5) for each student.
- Red, blue, green, and yellow pencils, pens, or crayons.
- Scissors and paste (optional).

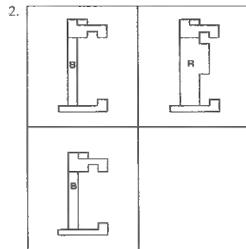
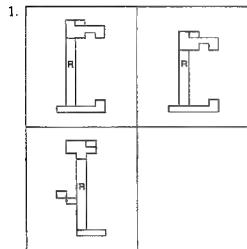
Students will use Moppet cards and shape cards for many activities throughout MOPTOWN HOTEL. You may want to make several classroom sets and mount them on tagboard. You may even wish to laminate them to make them more permanent. (When using these sets, students should not paste their answers onto the activity sheets.) The Who's Next? activity sheet is just like the game students play at the computer. With this and other activity sheets involving Moppets, it is important to have students color the

**What's Missing?**

NAME \_\_\_\_\_

**Who's Next?**

First color the Moppets. Then use Muppet cards to decide who lives next door.



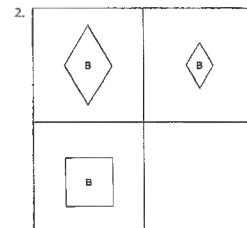
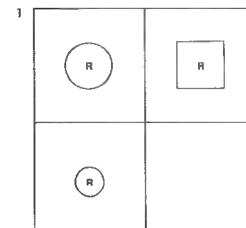
**What's Missing?**

NAME \_\_\_\_\_

**What's Next?**

First color all the shapes. Then use your shape cards to fill the empty squares.

R = Red B = Blue Y = Yellow G = Green



Moppets red and blue according to the labels (R and B) before they begin the activity. Students should also color and cut apart the cards on the Muppet Cards activity sheet. Then, for each analogy box in Who's Next?, students should complete the analogy by placing the appropriate Muppet card in the empty square. Check their work and have students try again if they have the incorrect response. When they have the correct response, they can paste the Muppet in place if they wish.

The What's Next? activity sheet is just like Who's Next?, but instead of working with Muppet traits, students work with these traits: size, color, and shape. Be sure to have students color the shapes according to the labels before they begin the activity. They should also color and cut apart the Shape Cards. Then have students complete this activity the same way they did Who's Next? After they complete the analogy, check their work, and, if they wish, have them paste the correct shapes in place.

Before distributing the Thinking About Similarities activity sheet, discuss relationships such as opposites, similar pairs, or things that go together. Write some examples on

**What's Missing?**

NAME \_\_\_\_\_

**Thinking about Similarities**

Fill in the missing word in each set.

1.

big	little
long	

4.

sugar	sweet
lemon	

2.

bird	nest
pig	

5.

night	moon
day	

**What's Missing?**

NAME \_\_\_\_\_

**Ratios**

These are ratios. The first one has been done for you. Can you figure out the rest?

1.

2	:	4
6	:	12

4.

3	:	4
15	:	

2.

6	:	2
9	:	

5.

4	:	36
5	:	

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## Who's Next Door?

the chalkboard and ask students for others. Then have students complete the activity sheet on their own, supplying the missing word for each set. When they have finished, they can compare their responses. Be sure to point out that more than one answer may be correct. You may want to use this as an opportunity to discuss synonyms.

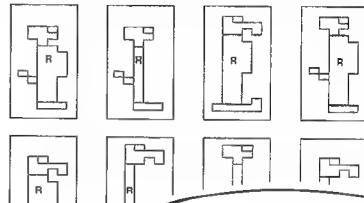
The Ratios activity sheet requires students to complete mathematical analogies, or ratios. It is appropriate for students familiar with multiplication, division, and fractions. Before distributing the activity sheet, write some examples of ratios on the board. Ask students if they can identify any relationships in the number sets. Ask questions such as "If 5 goes with 10, then what will 3 go with?" Congratulate students for correct answers and answers on the right track. Then have students complete the activity sheet on their own. When they have finished, they can compare their answers.

What's Missing? \_\_\_\_\_ NAME \_\_\_\_\_

### Moppet Cards

First color all the Moppets. Then cut them out to make Moppet cards.

Red Moppets

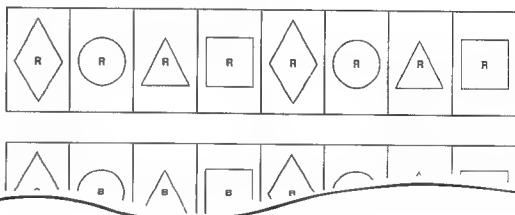


What's Missing? \_\_\_\_\_ NAME \_\_\_\_\_

### Shape Cards

First color all the shapes. Then cut them out to make shape cards.

R = Red B = Blue Y = Yellow G = Green



## CREATE YOUR OWN ANALOGIES

In this activity, students will write their own analogies in sentence form.

You need:

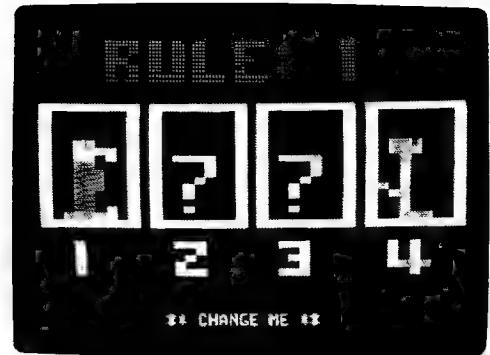
- Paper for each student.
- Dictionaries and Thesauri.

Introduce this activity by having students create sentences using the analogies on the activity sheet Thinking About Similarities. Write the sentences on the chalkboard. Then have students suggest other analogies as you record them on the chalkboard. Instruct students to use these or their own sets to write analogies in full sentences on their paper. You may want to allow them to use a dictionary or thesaurus to locate synonyms or antonyms. When they have finished, have students read their sentences aloud and compare their results. Collect the activity sheets to start a class analogies book.

## **2 Change Me**

### **Objectives**

- Controlling variables.
- Planning ahead.
- Using problem-solving skills.



In this game, students see the first and last Moppets in what will be a series of four Moppets, and must decide which Moppets to put in the middle two spaces. Each of the four Moppets must be different from the one before it by a specified number of traits (either one or two). This can be a difficult task for some students. Students will not become frustrated by the game if you allow them plenty of practice solving this type of problem before they play the game at the computer.

### **On-Line Presentation**

Have students solve problems that require them to set up a series of figures so that each one is different from the one before it in a specified number of ways. Then change the problem by setting up two figures and asking students to place two figures between them so that each of the four is different from the one before it in a specified number of ways. Because the geometric shapes from the Shape Cards have fewer traits than the Moppets, you may find them especially helpful in familiarizing students with the basic concepts of the game.

After the program has been loaded and the menu appears, ask a student to press **2** to load the second game, "Change Me." The game begins with a display of four boxes: the first and last each have a Moppet inside, and the middle two have question marks. Above the boxes, students will see RULE: 1, which indicates the number of ways each Moppet must be different from the one before it. Below the boxes, students will see the question, WOULD YOU LIKE INSTRUCTIONS? (Y or N).

## Change Me

Ask one student to sit at the computer while the class reviews the instructions. Have the student answer the question on the screen by pressing **Y** for *yes*. (Later, students can skip the instructions and start the game by pressing **N** for *no*.) The instructions demonstrate the principle of the game, first for a one-trait game and then for a two-trait game. Read the instructions aloud and review them with students, having the student at the computer press **RETURN** to continue after you have discussed each screen. Answer any questions students have, and then have the student at the computer press **RETURN** to start the game.

**Playing the Game** Choose one student to play the game at the computer while the rest of the class watch. Students can take turns telling the computer operator which Muppet to put in each box.

First ask students to look at the rule to see if the Muppets in this game should be different by one or two traits. Then help them answer the question **WHO COMES NEXT?** by asking, "What are the traits of the first Muppet? How could you make the second Muppet different in one way (or two ways)? How does the last Muppet differ from the first Muppet?"

Help students focus on the traits of the Muppets as they decide which Muppet will satisfy the game rule. To choose the next Muppet, players must answer a question such as **TALL OR SHORT?** for each of the four pairs of Muppet traits. Read the questions aloud and discuss the following points:

- Players select a trait by pressing the key for the first letter of the desired trait.
- Players must select all four traits for a Muppet correctly before they will see the Muppet appear on the screen.
- When choosing the Muppet for the third box, players must consider the traits of the Muppets in both the second and fourth boxes to be sure the Muppet they choose satisfies the game rule.

If players choose traits for a Muppet that are not different from the one before it by the number of ways specified in the game rule, they will see a message such as **YOUR MOPPET IS DIFFERENT IN 3 WAYS. PRESS <RETURN> AND CHOOSE AGAIN.** The incorrect Muppet will disappear from the screen. If they choose traits for the third Muppet so that it is different from the second one in the correct number of ways but the number of differences between the third and fourth

Moppets is incorrect, students will see a message such as SORRY, BUT IT TAKES 4 CHANGES TO MAKE #4. PRESS <RETURN> AND TRY AGAIN.

Players get as many tries as they need to choose a Moppet that satisfies the rule for each box. When players choose an incorrect Moppet, encourage them to identify which of the traits of the incorrect Moppet are different from the one before it (and after it in the case of the third Moppet). This will help them develop a strategy for correcting their Moppet so that it will be different by the number of ways set by the rule.

When players have chosen Moppets for each box correctly, they will hear music as the frames of the boxes flash and the message YOU WIN appears on the screen. Then they will see the question PLAY AGAIN? (Y OR N). Pressing **Y** for yes will start another game; pressing **N** for no will return players to the menu.

Once students understand how to play the game, they can take turns playing at the computer. The rest of the class can participate in off-line activities that reinforce the concepts introduced in the computer game.

## Off-Line Activities

**MOPPET TRAINS** In this activity, students solve puzzles just like the ones in the computer game and create puzzles of this kind for their friends to solve.

You need:

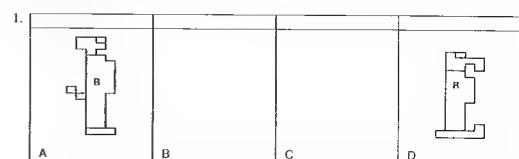
- An activity sheet (page 8, 9, 10, or 11) for each student.
- A set of Moppet cards (page 3) for each student.
- Red and blue pencils, pens, or crayons.
- Scissors and paste (optional).

Students can use the activity sheets either with sets of the Moppet cards which students have colored and cut apart or with permanent cards you have made.

Moppet Trains NAME \_\_\_\_\_

### One- and Two-Difference Trains

First color all the Moppets. Then use your Moppet cards to complete this puzzle. For each Moppet, change only one trait to find the next one. Be sure the last Moppet has only one trait different from the third Moppet.



This time try changing two traits for each Moppet.

## Change Me

When using the One- and Two-Difference Trains activity sheet, be sure students color the Moppets red and blue before starting. Have students find a solution to the first puzzle, pasting the Moppets in the squares if they wish. Then have students compare their solutions and strategies for finding them with other students. Repeat this procedure for the second puzzle on the page.

When using the Making Your Own Puzzles activity sheet, have students create a difference train using their Moppet cards. If they are using the top row, each Moppet must have only one trait different from the Moppet before it. On the bottom row, each Moppet must have exactly two traits different from the one before it. When students have completed their trains, have them remove the second and third cards, leaving only the first and last ones on the board. The cards they remove should be mixed in with the ones left over from creating the difference trains. Then have each student switch places with a partner and solve each other's puzzle. Afterward, students can discuss how they created the puzzles and what strategies they used for solving them.

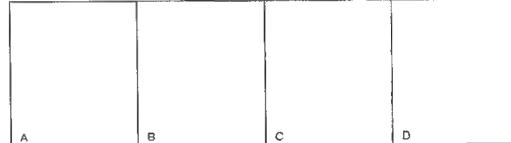
The two activity sheets What is the Difference Rule? and A Continuous Moppet Train have circular Moppet trains. Note that the solution for the continuous train requires that all the Moppets in the circle have a specified number of traits different from the Moppets on both sides of them. The activity sheets do not specify the number of differences, so you can use them for games with various numbers of differences. You may want to have students solve them as one-difference puzzles the first time they try to solve them. If students wish to, they can paste the Moppets in place on the page. Because students de-

### Moppet Trains NAME

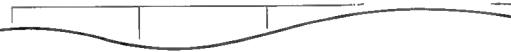
#### Making Your Own Puzzle

Make a Moppet train puzzle for your friend to solve. Put a Moppet in the first and last squares of each row. Be sure you know the solution!

##### 1. One Difference



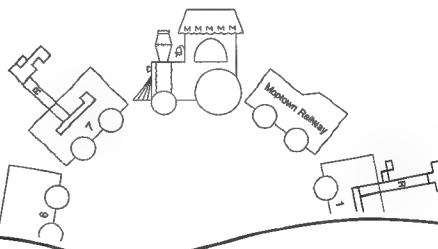
##### 2. Two Differences



### Moppet Trains NAME

#### What is the Difference Rule?

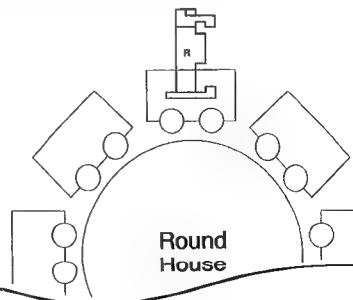
First color the Moppets on this page. Then use your Moppet cards to figure out the seating order on this train. It might fool you!



### Moppet Trains NAME

#### A Continuous Moppet Train

These cars got stuck in the round house waiting for their engine to change direction. Put the Moppets in their seats so they will be in a correct order no matter which way the engine goes.



velop their own strategies for solving the puzzles, you should ask students to discuss and compare their strategies with other students. Then challenge students to complete the activity sheets as two-difference puzzles, and have them discuss their results.

**WORD TRAINS** In this activity, students apply to word trains the skills they used to solve the Moppet trains. To solve word trains, they must change a specified number of letters in a word to create a new word within a closed set of words.

You need:

- An activity sheet (page 12, 13, or 14) for each student.

**Word Trains** NAME

**Change a Letter**

Change one letter of the word in square A to make a new word in square B. Then change one letter of the word in square B so it has only one letter different from the words in square B and square D. Put it in square C.

1. 

bed			lot
A	B	C	

**Word Trains** NAME

**More Word Changes**

In each column, turn the word in A into the word in D by making one change in the word for each step.

1. 

first	
A	

2. 

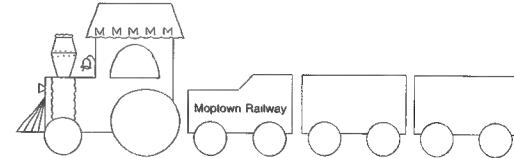
fun	
A	

**Word Trains** NAME

**Make Your Own**

Make your own word train.

**Moplown Railway**



Before distributing the activity sheets, write examples of word trains on the chalkboard. Be sure to show examples that include adding and deleting letters. Have students suggest changes and discuss why a particular change can or cannot be made. Then, using either Change a Letter or More Word Changes, have students complete the trains and discuss the results with the class. Ask, "How did you find your answers? What strategies did you use? Was it easier or harder to work with just three-letter words? Why? Did adding and deleting letters make it easier or harder? Why?" Then have students create puzzles using the Make Your Own activity sheet and give them to their friends to solve.

## **3 Spot Me**

### **Objectives**

- Analyzing traits.
- Recognizing variables.
- Using inference to find the greatest difference.
- Using problem-solving skills.



In this game, students identify the least common trait among four Moppets. That is, they identify which of four Moppets has a trait that none of the other three Moppets has. The concept of greatest difference is fairly sophisticated, yet when it is introduced in this game students seem to be able to grasp it with ease.

### **On-Line Presentation**

Before presenting "Spot Me" at the computer, introduce students to the concept of greatest difference using geometric shapes (page 5). Select four shape cards so that one of them has a trait that is shared with none of the others. Discuss the traits of each piece with the students, recording on the chalkboard how many of them share each trait. Then ask students to identify the piece that has a unique trait. You may want to repeat this activity using Muppet cards or the activity Find the Unique Muppet.

After the program has been loaded and the menu appears, ask a student to press **3** to load the third game, "Spot Me." Four Moppets will appear on the screen with the numbers 1-4 below them. Below the Moppets, students will see the questions CAN YOU SPOT ME? and WOULD YOU LIKE INSTRUCTIONS? (Y OR N). Ask a student to press **Y** for yes. (Later, students can skip the instructions and start the game by pressing **N** for no.)

Read the instructions aloud, or have a student read them, and discuss them with the class, pointing out that players will first identify the Muppet with the different trait and then specify which trait makes that Muppet different. Answer any questions students have, and then have a student press **RETURN** to start the game.

**Playing the Game** Choose one student to play the game at the computer while the rest of the class watch and advise. Along with the four Moppets and the numbers 1–4 below them, students will see the instructions, SPOT THE MOPPET WITH THE SPECIAL TRAIT. TYPE 1, 2, 3, OR 4 on the screen. Have students select a Moppet and then have the computer operator press the key for that number on the computer keyboard.

Players have as many chances as they need to answer this question correctly. When they have done so, they will hear happy notes and a frame will appear around the Moppet with the special trait. Then they will be asked to answer the question, WHAT SPECIAL TRAIT DOES IT HAVE? (1–8). There will be a numbered list of the eight Moppet traits for them to choose from. When players have answered this question correctly, taking as many chances as they need to get it right, they will hear happy notes and see YOU WIN! appear on the screen, along with a message such as RIGHT! ONLY MOPPET 2 IS A BIBBIT!

As you go through the game with students, make sure they understand the following points:

- To select the Moppet that has a special trait, players press its number on the keyboard.
- To select the special trait of that Moppet, players look at the numbered list on the screen and press the number on the keyboard for the trait they have chosen (not the first letter of the trait).
- Whenever players answer incorrectly, they will see a message such as IT'S NOT 3. (PRESS <RETURN>).
- Students can have as many chances as they need to identify the correct Moppet or trait.

After each game, players will have to answer the question PLAY AGAIN? (Y OR N). Pressing **Y** for yes will start another game with four new Moppets; pressing **N** for no will return players to the menu.

Once students understand the game, they can take turns playing at the computer. The rest of the class can participate in off-line activities that reinforce and extend the concepts developed in the computer game.

## Off-Line Activities

**FIND THE UNIQUE MOPPET** In this activity, students have the same task as in the computer game: they must identify which Muppet has a unique trait and then identify that trait. Responses may be oral or written, depending on the skill level of your students.

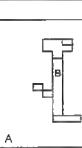
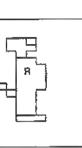
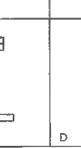
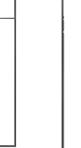
You need:

- An activity sheet (page 15, 16, or 17) for each student.
- Blue and red pencils, pens, or crayons.

**Find the Unique Muppet**

### Who is Different? I

First color all the Muppets. Then write the letter of the Muppet who has a trait that no other Muppet has.

			
A	B	C	D

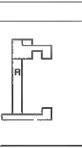
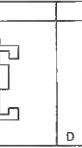
1. Who is the most different in the row above? \_\_\_\_\_

Students should first color the Muppets red and blue according to the labels. They should then complete the page by writing the letter of the Muppet with a unique trait and stating why in the spaces provided (or by giving the answers orally). Discuss the results with the class.

**Find the Unique Muppet**

### Who is Different? II

First color all the Muppets. Then write the letter of the Muppet who has a trait that no other Muppet has.

			
A	B	C	D

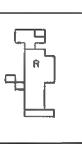
1. Who is the most different in the row above? \_\_\_\_\_

2. Why? \_\_\_\_\_

**Find the Unique Muppet**

### Who is Different? III

First color all the Muppets. Then write the letter of the Muppet who has a trait that no other Muppet has.

			
A	B	C	D

1. Who is the most different in the row above? \_\_\_\_\_

2. Why? \_\_\_\_\_

**WHICH IS THE MOST DIFFERENT?** In this activity, students will apply the skills they used in the computer game and on the Who is Different? activity sheets to find the most different word, math problem, or sentence in a set. Identifying the most different math problem or sentence is a more difficult task, so Looking at Mathematical Expressions and Looking at Sentences are more appropriate for older students. (For page 20, it is not necessary that students be able to name the different parts of speech in order to describe why one sentence is different from the others.)

You need:

- An activity sheet (page 18, 19 or 20) for each student.

For each activity sheet, present the appropriate concept with examples at the chalkboard. Note that for Looking at Words, students should consider the structures of the words, not the semantic values; for Looking at Mathematical Expressions, they should consider each problem's solution, not the numbers in the problem; and for Looking at Sentences, they should consider whether each sentence is a declarative sentence or a question as well as look for changes in meaning caused by substituting key words.

Have students complete the activity sheets on their own or in small groups and then discuss the answers with the whole class. There may be some disagreement among students as to which word or sentence is the most different, so be sure to have them justify their responses in the discussion.

Which is the Most Different?

NAME \_\_\_\_\_

### Looking at Words

thank	think	thin	tin
A	B	C	D

1. Which word is the most different? \_\_\_\_\_

2. Why? \_\_\_\_\_

Which is the Most Different?

NAME \_\_\_\_\_

### Looking at Mathematical Expressions

24-12	4+4+4	24×12	24÷4-4-4
A	B	C	D

1. Which problem is the most different? \_\_\_\_\_

2. Why? \_\_\_\_\_

Which is the Most Different?

NAME \_\_\_\_\_

### Looking at Sentences

Look at the sentences in each box and decide which is the most different. Tell why you think so.

1.

A. You will go to the store.  
 B. The store is where you will go.  
 C. Will you go to the store?

Which is the most different? \_\_\_\_\_  
 Why? \_\_\_\_\_

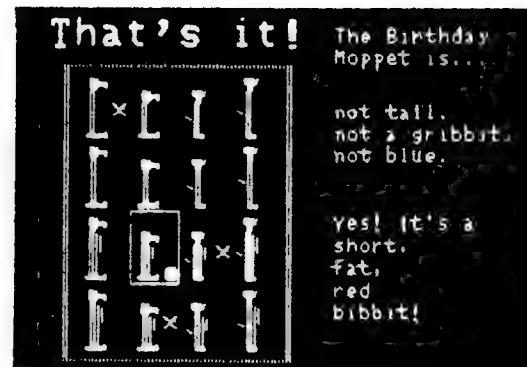
2.

A. John can see the plane on the runway.  
 B. Can John see the plane in the sky?  
 C. Plane on the runway is what?

## 4 Whose Birthday?

### Objectives

- Using negative information.
- Identifying traits.
- Selecting variables.
- Using problem-solving skills.



In this game, students use negative information in problem solving. The object of the game is to guess which Moppet is the Birthday Moppet. When players guess a Moppet, the response they get on the computer identifies one trait of that Moppet that the Birthday Moppet does *not* have. Players can then eliminate that trait from the list of traits that will correctly describe the Birthday Moppet.

### On-Line Presentation

Because the Moppets and the print on the screen in this game are small, it is difficult to play this game with a large group. You may want to introduce students to the game with the activity called Which One? Then you could introduce the computer game to students in groups of two or three.

After the program has been loaded and the menu appears, have a student press **4** to load the fourth game, "Whose Birthday?" A picture of a Moppet birthday party will appear on the screen along with the question **WOULD YOU LIKE INSTRUCTIONS? (Y OR N)**. Ask a student to press **Y** for *yes*. (Later, students can skip the instructions and start the game by pressing **N** for *no*.)

Read the instructions aloud, or have a student read them, and discuss them with the group. Explain to students that they will move the cursor next to the Moppet they want to guess by pressing the **I**, **J**, **K**, and **M** keys. Then they should press **SPACEBAR** to enter their guess. Answer any questions students have, and then have a student press **RETURN** to start the game.

**Playing the Game** The game begins with a display of the sixteen possible Moppets. The arrangement of the Moppets varies from game to game, so players have to pay close attention to identify traits.

As players make guesses, they should observe the following points about the game:

- Players move the cursor by pressing the **I** key to go up, the **M** key to go down, the **J** key to go left, and the **K** key to go right.
- When the cursor is next to the Moppet they want to guess, players press the **SPACEBAR**.
- If players guess a Moppet that is not the Birthday Moppet, an **X** appears next to the Moppet. A clue then appears that tells one trait of the guessed Moppet that the Birthday Moppet does not have, for example, **THE BIRTHDAY MOPPET IS NOT RED**.

Although the first guess is random, students should use the negative clues to help them decide which Moppet to guess next. For example, if the first guess is a tall, short, red Bibbit and the clue indicates that it is not a red Moppet, players should conclude that the Birthday Moppet is blue. Thus, each negative clue gives players more information for narrowing the range of choices for their next guess. Encourage students to examine the data compiled from their guesses; continued, random guessing should be discouraged.

When players guess the Birthday Moppet, they will hear a birthday tune and a frame will appear around the Birthday Moppet. There will also be messages on the screen such as, **YES, IT'S A TALL, FAT, BLUE BIBBIT!** and **THE MOPPET RECEIVED 5 PRESENTS!** The number of presents varies according to the number of guesses players take to guess the right Moppet; the greater the number of guesses, the fewer the presents.

After each game, players will have to answer the question **PLAY AGAIN? (Y OR N)**. Pressing **Y** for *yes* will start a new game; pressing **N** for *no* will return players to the menu.

While students take turns playing the game at the computer, other students can be involved in off-line activities that reinforce and extend the concepts developed in the computer game.

## Whose Birthday?

### Off-Line Activities

**WHICH ONE?** In these games, students use negative clues to locate the Secret Moppet, secret shape, or other secret object in a set of objects created by the teacher. Note that the shapes version of the game is easier than the Moppet version and is more appropriate for younger students.

You need:

- An activity sheet (page 21, 22, or 23) for each player.
- Red, blue, yellow, and green pencils, pens, or crayons.
- Sets of small pictures that have common features.
- Paste.
- A set of Moppet cards (page 3), geometric shape cards, (page 5), or cards made from a set of small pictures.
- Bingo markers or large dried beans.

Students can play the Secret Moppet or Secret Shape games either with Moppet or shape cards which students have colored and cut apart themselves.

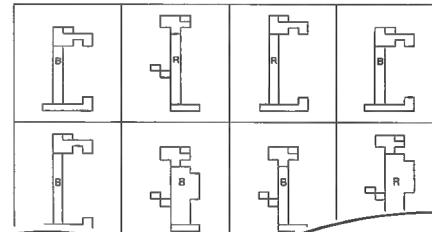
Have students color the Moppets or shapes on their game boards according to the labels. To use the game board on page 23, prepare sets of small pictures that have common features and have students paste them to their game boards.

If you want to use color as a feature, use colored pictures or have the students color them. Be sure all sets of pictures are exactly the same.

**Who is the Secret Moppet?**

NAME \_\_\_\_\_

Color all the Moppets on this page before playing the game.

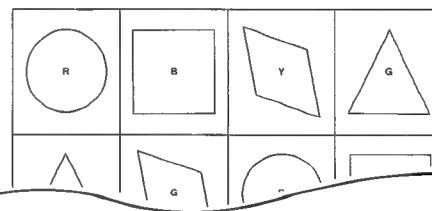


**Which is the Secret Shape?**

NAME \_\_\_\_\_

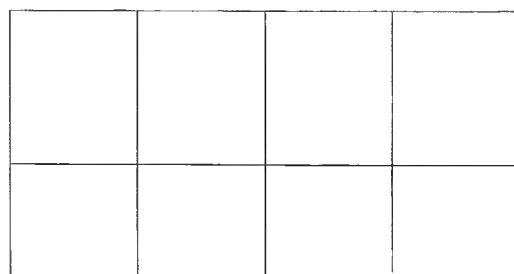
Color all the shapes on this page before playing the game.

R = Red   B = Blue   G = Green   Y = Yellow



**Game Board**

NAME \_\_\_\_\_



To play:

- The teacher secretly selects a card (a Moppet card, a geometric shape card, or one of the small picture cards, depending on the game) from the game set and puts it aside where no one can see it.
- Players take turns identifying specific Moppets, shapes, or pictures, trying to guess the secret one.
- If players have incorrectly guessed the secret Moppet, shape, or picture, the teacher gives a negative clue such as "It is not red." Players then use markers to cover the squares on their game boards for Moppets, shapes, or pictures that have that trait.

To win:

- When a player correctly identifies the Secret Moppet, shape, or picture, that player is the winner and may then select the secret card for the next game and answer the other players' questions.

When playing the game with the picture sets you created, you can vary the rules by having players ask a question that can be answered "yes" or "no," such as "Is it a boy?" When the answer is "yes," players mark the squares on their game boards containing pictures that have that trait, and when the answer is "no," players mark the squares containing pictures that do not have that trait.

**WHO GOES THERE?** In this activity, students use the descriptions at the top of each column and at the side of each row as rules for placing Moppets in the boxes.

You need:

- An activity sheet (page 24 or 25) for each player.
- An enlarged demonstration copy of page 24.
- A set of Moppet cards (page 3) for each player.
- Red and blue pencils, pens, or crayons (optional).
- Scissors and paste (optional).

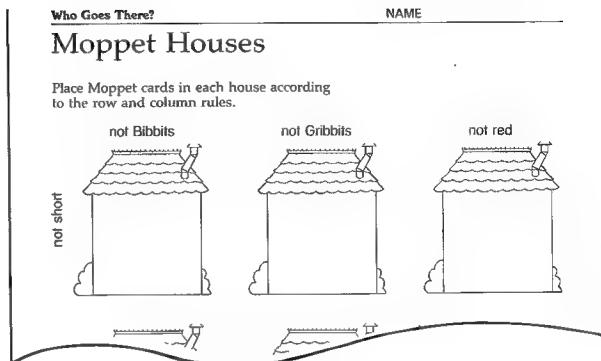
Who Goes There?		NAME _____	
		Two-Trait Grouping	
Place Moppet cards in each space according to the row and column rules.			
Gribbit	red	not red	

## Whose Birthday?

Students can use this activity sheet with the Moppet cards which students have colored and cut apart themselves.

Use the enlarged copy of the activity sheet to demonstrate. Have a student select a box and give the rule for the column and the row that the box is in. Point out that some of the boxes in Two-Trait Grouping and all the boxes in Moppet Houses have rules specifying traits which Moppets going in that box cannot have. Ask another student to select one Moppet that fits the rule. Place the selected Moppet card in the box and discuss how it follows the rules for the box. (If the student makes an error in the selection, place the card in the box. Then ask students if it follows the rules and have them explain why it does not.)

After filling one or two boxes as a group, students can complete the activity sheets on their own. Or, fill all the boxes as a group and then challenge students to complete their activity sheets using Moppets that are different from the ones on the demonstration sheet but that still follow the rules. If students wish to, they can paste the Moppets in place on their activity sheets.



## **5 Secret Pal**

### **Objectives**

- Identifying traits.
- Keeping variables constant.
- Inventing strategies.
- Making inferences.
- Using problem-solving skills.



In this game, students work with several variables at the same time. In order to find a solution to the problem, they must learn how to use keeping variables constant as a problem-solving strategy. The object of the game is to identify the secret pal Muppet. After players select four traits to describe a Muppet, they see a display on the screen indicating how many of those traits the secret Muppet has. They do not find out, however, which traits are the common ones. Players must then develop a strategy for using the given information to determine the four traits of the secret pal. Most likely, this strategy will involve seeing how changing only one trait, while holding the other three constant, will affect the number of traits the guessed Muppet has in common with the secret Muppet.

### **On-Line Presentation**

After the program has been loaded and the menu appears, have a student press **S** to load the fifth game, "Secret Pal." A series of four Muppet figures, which progressively develop into a tall, thin blue bibbit, will appear on the screen. The fourth Muppet will have a flashing frame around it, and students will see the messages MEET MY SECRET PAL! and WOULD YOU LIKE INSTRUCTIONS? (Y OR N). Ask a student to press **Y** for yes. (Later, students can skip the instructions and start the game by pressing **N** for no.)

Read the instructions aloud and discuss them with the class. Explain to students that after they select four traits to describe any Muppet, they will find out how many of those traits, but not which ones, are shared by the secret Muppet. Ask students how they could use this information to help determine the four traits of the secret Muppet. Then have a student press **RETURN** to start the game.

**Playing the Game** Choose one student to play the game at the computer while the rest of the class watch and advise. When the game begins, the question WHO'S MY SECRET PAL? is displayed on the screen. To describe a Muppet, players must answer a question such as TALL OR SHORT? (T OR S) for each of the four pairs of Muppet traits. As players answer the questions, the question mark is replaced by a Muppet figure as described by the four traits chosen, and the words for the traits are displayed. After answering the four trait questions, players will see marks below the Muppet, one for each trait that the Muppet shares with the Secret Pal Muppet.

As players repeat this process of describing Muppets and seeing how many traits each has in common with the secret pal, they should observe the following points about the game:

- Each Muppet that players describe, and the marks for it, remain on the screen until the Secret Pal is found, so players can use all this information to find the solution.
- If, when players hold three traits constant and change one trait (for example, the first guess is *tall*, thin red gribbit and the second is *short*, thin red gribbit) the number of correct traits is reduced by one, players should conclude that the original choice for the changed trait was correct.
- Similarly, if players change only one trait and the number of correct traits is increased by one, players should conclude that the second choice for the changed trait is correct.
- If no marks appear on the screen for a Muppet described, it has no traits in common with the Secret Pal. In this case, the secret Muppet is the "opposite" of the one described.

When players correctly describe the secret Muppet, they will hear happy notes, and a frame will appear around the Muppet on the screen along with the message YOU FOUND MY SECRET PAL! If, after nine chances, players have not yet identified the secret pal, they will hear sad notes, and the Secret Pal will appear on the screen with a message such as THIS IS MY FRIEND. SHORT, THIN BLUE BIBBIT.

After each game, players will have to answer the question PLAY AGAIN? (Y OR N). Pressing **Y** for yes will start a new game; pressing **N** for no will return players to the menu.

Once students understand the game, they can take turns playing at the computer. The rest of the class can be involved in off-line activities that reinforce and extend the concepts developed in the computer game.

## Off-Line Activity

**SECRET PAL GAME** This game can be played by two players or two teams. One player (or team) selects a Moppet and the other player (or team) tries to guess which one it is. After each guess, the player who has selected the Moppet tells the guessing player how many traits the guessed Moppet has in common with the secret Moppet.

You need:

- An activity sheet (page 26) for each team.
- A set of Moppet cards (page 3) for each team.
- Small markers or dried beans.

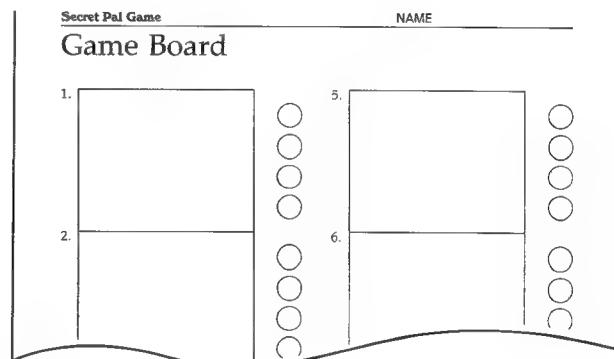
Students can play this game with the Moppet cards which students have colored and cut apart. You may want to use an enlarged game board to demonstrate the game to the class before having students play on their own.

To play:

- The first team selects a Moppet card from their set and conceals it from the other team.
- The second team selects a Moppet card from their set and places it on the game board in the first square.
- The first team places a marker in the circles next to the box for every trait that the guessed Moppet has in common with the secret Moppet.
- The second team has eight chances to guess the secret Moppet. If they don't guess it by then, the first team reveals the secret Moppet.
- After the second team correctly guesses the first Moppet, the teams switch roles and play again.

To win:

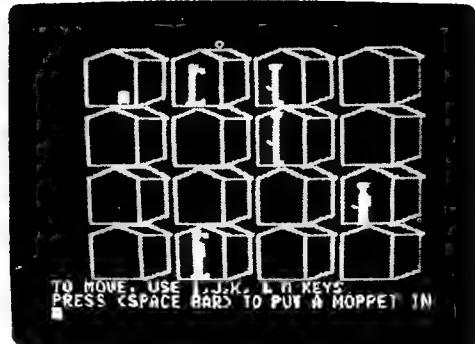
- The team that guesses the secret Moppet with fewer guesses wins.



## **6 Moptown Map**

### **Objectives**

- Using arrays to arrange information.
- Controlling variables.
- Using double sorting.
- Making inferences.
- Using problem-solving skills.



In this game, students work with an array, a valuable tool for sorting and arranging information. Students were introduced to the array in "Who's Next Door?" The array in "Moptown Map" is larger than the one in that game and allows more information to be compared. Because arrays can be used to arrange, sort, and then compare information, they make rich educational tools. They are helpful for sorting information in content areas such as science and social studies, and they are indispensable for recording information in science experiments. Students will be able to apply the skills used in this game to a variety of problem-solving activities.

The Moptown map consists of a  $4 \times 4$  array of sixteen houses. Each row and column has two secret rules that determine which Moppets can live there. (For example, a rule could be "only tall and red Moppets live in this row.") The object of the game is to put all sixteen Moppets in houses according to the secret rules for that game.

### **On-Line Presentation**

Before introducing "Moptown Map" at the computer, you may want to introduce students to the concept of the game using the activity Moptown Neighbors (see p. T38), which has the same objective but uses a smaller array for the game board.

After the game has been loaded and the menu appears, have a student press **6** to load the sixth game, "Moptown Map." An array of sixteen colored houses will appear on the screen along with the question **WOULD YOU LIKE INSTRUCTIONS? (Y OR N)**. Ask a student to press **Y** for *yes*. (Later, students can skip the instructions and start the game by pressing **N** for *no*.)

Read the instructions aloud, or have a student read them, and discuss them with your class, pointing out that each row and column will have two rules. Remind students that there are sixteen Moppets, and explain that each one will go into one of the houses according to the row rules and the column rules. To try to place Moppet in a house, players will use the **I**, **J**, **K**, and **M** keys to move the cursor to that house. Then, after they press **SPACEBAR**, they will choose the four traits for the Moppet. Answer any questions students have, and then have one student press **RETURN** to start the game.

**Playing the Game** Choose one student to play the game at the computer while the rest of the class watch and advise. When the game begins, players will see five Moppets in their houses. These Moppets are to be clues for the row and column rules, and players should look at them closely to determine which traits are shared by Moppets in the same row or column. Once they have done this, they can try to use that information to place the rest of the Moppets in their houses. As the game progresses, students should observe the following points about the game.

- Players move the cursor by pressing the **I** key to go up, the **M** key to down, the **J** key to go left, and the **K** key to go right.
- Once the cursor is in the house players want it in, players must press **SPACEBAR**. If that house already has a correct Moppet in it, they will see a message on the screen directing them to choose another house.
- If, after pressing **SPACEBAR**, players change their mind and want to try another house, they can press **M** to move again. Otherwise, they will answer questions on the screen to describe the Moppet they think goes there.
- If players want to change the traits they have selected before they have entered all of them, they can use the left arrow key **←** to start again. (Use **DELETE/BACK S** for Atari.)
- If players correctly describe the Moppet that goes in that house, they will hear happy notes and the Moppet will appear inside the house. Players can then move the cursor to another house.
- If players describe a Moppet that does not go in that house, they will hear sad notes and the Moppet will appear inside the house with an x by it. This Moppet will stay in the house until it is replaced by another one. Players can then either move the cursor to another house or press **SPACEBAR** to try to put another Moppet in the same house.

## Moptown Map

If players are having difficulty and need to start over, they can press **ESC**. When they see the question DO YOU WANT TO STOP? (Y OR N) on the screen, they should press **N** for *no*. (Pressing **Y** for *yes* will return players to the menu.) Then they will see TYPE 'N' TO START A NEW GAME OR 'C' TO CONTINUE THIS GAME (N OR C).

When players have correctly filled the houses, they will hear a happy tune and see a percentage score on the screen. The score reflects the number of times a player tried to enter an incorrect Muppet; the greater the number of errors, the lower the score.

After each game, players will have to answer the question PLAY AGAIN? (Y OR N). Pressing **Y** for *yes* will start a new game with a new set of rules; pressing **N** for *no* will return players to the menu.

While students take turns playing the game at the computer, other students can be involved in off-line activities that reinforce and extend the concepts developed in the computer game.

## Off-Line Activities

**TO WHOM DOES IT BELONG?** In this activity, students use size and color clues to match objects and Moppets.

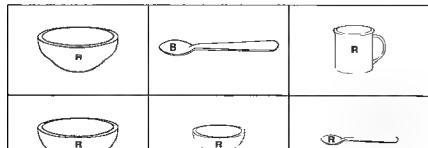
You need:

- Two activity sheets (pages 27 and 28) for each student.
- Red and blue pencils, pens, or crayons.
- Scissors and paste.

To Whom Does It Belong? NAME \_\_\_\_\_

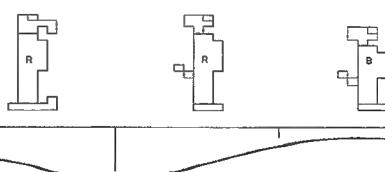
### Object Cards

First color these spoons, bowls, and cups red and blue. Then cut the squares apart and paste them in the squares on the Matching Characteristics activity sheet.



To Whom Does It Belong? NAME \_\_\_\_\_  
**Matching Characteristics**

Paste the spoons, cups, and bowls so that the spoon, cup, and bowl for each Muppet are in the column beneath that Muppet. All spoons should be in the same row, all cups should be in the same row, and all bowls should be in the same row.



First have students color the Object Cards and the Moppets according to the labels. Then have them cut out the Object Cards. Tell students that the Moppets are going to have breakfast, and that they need to set the table. The students are to help by putting the utensils that belong to each Muppet in the squares below it on the Matching Characteristics activity sheet.

Explain that all the bowls have to be in the same row, all the spoons have to be in the same row, and all the cups have to be in the same row. Check the students' arrangements, asking them why they chose a particular row or column for various objects. This is especially important if they have made errors. (It is better for students to justify their responses and discover their errors than for you to point them out.) When students have correctly arranged all the utensils, they may paste them in place.

**FINISH THE PUZZLE** In this activity, students complete puzzles so that all pieces with the same shape are in the same horizontal or vertical line and all pieces with the same color are in the same horizontal or vertical line.

You need:

- An activity sheet (page 29 or 30) for each student.
- A set of shape cards (page 5) for each student.
- Red, blue, green, and yellow pencils, pens, or crayons.
- Scissors and paste (optional).

Students can play this game with the shape cards they have colored and cut apart.

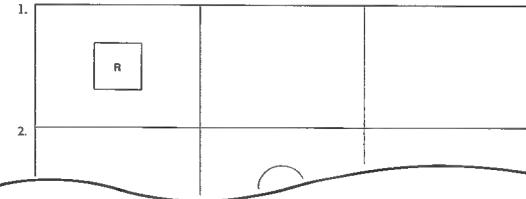
Explain to students that they are to complete the puzzle by placing each shape in the correct square. As students work on their puzzles, help them by removing pieces that are in incorrect squares so they may try again. Be sure to observe their strategies. (Students who have difficulty solving the

**Finish the Puzzle** NAME \_\_\_\_\_

**Matching Rows and Columns I**

First color the shapes on this page. Then use your shape cards to complete this puzzle.

R = Red B = Blue G = Green Y = Yellow

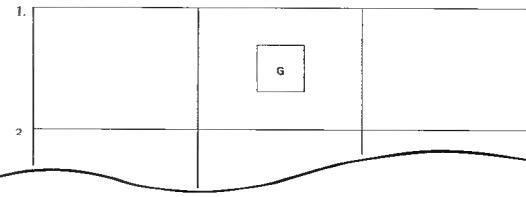


**Finish the Puzzle** NAME \_\_\_\_\_

**Matching Rows and Columns II**

First color the shapes on this page. Then use your shape cards to complete this puzzle.

R = Red B = Blue G = Green Y = Yellow



## Moptown Map

puzzles need extra help in working with arrays and developing strategies.) When students have solved the puzzle, they can paste the shapes in place if they wish.

There are two basic strategies students use to solve this kind of puzzle: one is to first find the pieces that match either the color or the shape of the pieces on the game board; the other is to find pieces that match both the color and the shape. With the first strategy students use single sorting. With the second strategy they use double simultaneous sorting. Students using the latter strategy are now able to hold two pieces of information in their memories at the same time. They have reached a developmental level whereby they can deal with such concepts as multiple sounds for letters (particularly vowels), multiplication, and fractions (where numbers indicate parts as well as the whole).

**MOPTOWN NEIGHBORS** In this activity, students complete puzzles so that all Moppets in the same row or column have two traits in common. They also create their own puzzles of this kind for their friends to solve.

You need:

- An activity page (page 31, 32, or 33) for each student.
- A set of Moppet cards (page 3) for each student.
- Red and blue pencils, pens, or crayons.
- Scissors and paste (optional).

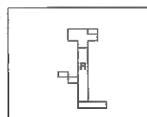
Students can do this activity with the Moppet cards on page 3 which they have colored and cut apart.

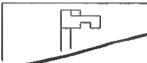
First have students color the Moppets on the activity sheets red and blue according to the labels. Then have them complete the puzzle by putting the Moppet cards in the squares so that all the Moppets in each row and column have two traits in common. Help them by removing Moppets they have placed incorrectly so they can try again. When students have completed the puzzle cor-

**Moptown Neighbors** \_\_\_\_\_ NAME \_\_\_\_\_

### Fill the Houses I

First color all the Moppets on this page. Then use your Moppet cards to fill the boxes on this map.

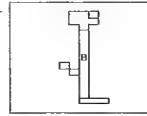
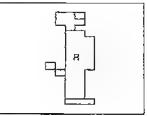
1.   

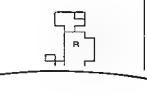
2.   

**Moptown Neighbors** \_\_\_\_\_ NAME \_\_\_\_\_

### Fill the Houses II

First color the Moppets on this page. Then use your Moppet cards to fill the boxes on this map.

1.   

2.   

rectly, they can paste the Moppets in place if they wish. Have students discuss their strategies and solutions with the class.

To create a puzzle using Design Your Own, students should first determine the rules for the rows and columns. The easiest way to do this is to sort Moppets on the board according to some rules. Then students remove all but four pieces from the board, leaving one Muppet in each row and column. Then they can give their puzzles to another student to solve. Students should discuss their strategies for constructing and solving the puzzles afterwards.

**MATH ARRAY** In this activity, students create addition or multiplication tables using arrays. (You determine which numbers to use for the arrays according to the ability of your students.) The arrays reinforce students' math skills and introduce them to the wide variety of applications of arrays in problem-solving activities.

You need:

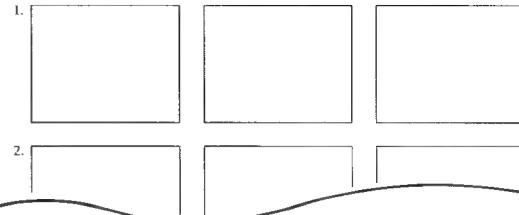
- An activity sheet (page 34 or 35) for each student.

Explain to students how to write the numbers you give them in the top row and left column of squares in the array. Then demonstrate how to use the array, using three or four randomly chosen pairs of numbers. (Avoid choosing pairs from a single row or column, as some students will recognize that a pattern occurs, and this will give away one of the strategies for completing the array.) After students have completed the table, draw the array on the chalkboard and have students supply the answers they found for each number pair. Have them discuss any strategies they developed for solving the problems.

Moptown Neighbors NAME \_\_\_\_\_

### Design Your Own

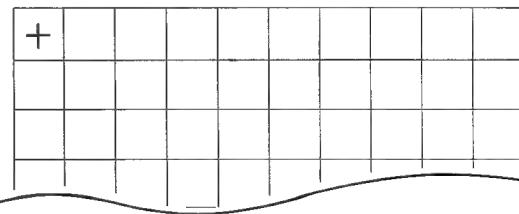
Create your own Moptown Neighborhood.



Math Array NAME \_\_\_\_\_

### Addition Table

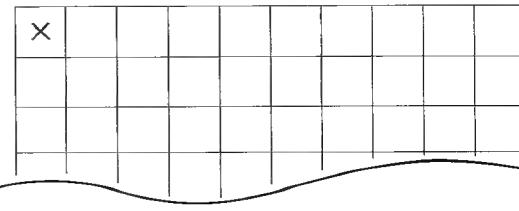
Use this array to create an addition table. Your teacher will tell you what numbers to put across the top row and down the left column.



Math Array NAME \_\_\_\_\_

### Multiplication Table

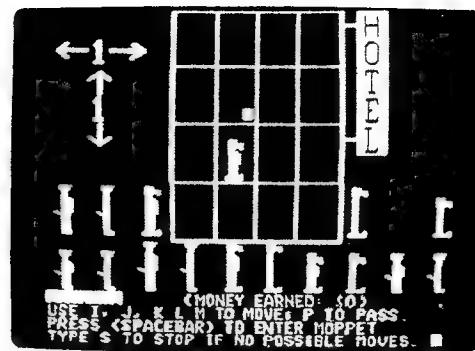
Use this array to create a multiplication table. Your teacher will tell you what numbers to put across the top row and down the left column.



## 7 Moptown Hotel

### Objectives

- Controlling variables.
- Using simultaneous sorting.
- Planning ahead.
- Developing strategies for problem solving.



"Moptown Hotel" is based on the same principles as "Moptown Map," but in this game players can change the rules that determine the number of traits which differentiate Moppets next to each other in the same row and Moppets above or below each other in the same column. This is a two-player game that can also be played by two teams. The players take turns acting as the hotel clerk by trying to put a Moppet into one of the rooms in the hotel according to the rules set for a particular game. For some combinations of row and column rules it will not be possible to fill all the rooms. This game provides considerable challenge for students, who must make good use of their problem-solving skills and strategies to play the game successfully.

### On-Line Presentation

This game may appear complicated to students when they first play it, so you may want to introduce it by using a transparency of the Moptown Hotel Game Board (Rooms for Rent) on an overhead projector.

After the program has been loaded and the menu appears, ask a student to press **7** to load the seventh game, "Moptown Hotel." A picture of the hotel will appear on the screen along with the question **WOULD YOU LIKE INSTRUCTIONS? (Y OR N)**. Ask a student to press **Y** for *yes* (Later, students can skip the instructions and start the game by pressing **N** for *no*.)

Read the instructions aloud, or have a student read them, and discuss them with the class. Explain to students that both players will earn a bonus if they fill the hotel, but that with some combinations

of row and column rules this will be impossible. Answer any questions students have. Then have one student press **RETURN** to start the game.

**Playing the Game** Choose two students to play the first game at the computer while the rest of the class watch. The first messages players see on the screen ask them to type in their names. If you are playing with teams, have students enter team names. Help them locate the proper keys on the keyboard and show them how to use the backspace (**←**) key to erase errors. After each player has entered his or her name, that player must press **RETURN**. Then the empty hotel and the rules (one for the columns and one for the rows) will appear on the screen.

Players will also see the question **WOULD YOU LIKE TO CHANGE THE RULES? (TYPE Y OR N)**. To keep the demonstration game simple, you may want to have one of the players type **N** for *no*. If they want to change the rules, however, have one of them type **Y** for *yes*. Then have them follow the directions on the screen to choose a number from 1 to 3 for each of the two rules. The numbers they choose will be displayed on the screen throughout the game.

Players now take turns trying to place a Moppet in the hotel according to the rules. The first player can select any Moppet and place it in any room to start the game. As they play the game, be sure students understand the following points:

- Players move the cursor to the room they want to put a Moppet in by pressing the **I**, **J**, **K**, and **M** keys to move up, left, right, and down.
- When the cursor is in the desired room, players must press the **SPACEBAR** to enter a Moppet there. If players change their mind after they press **SPACEBAR**, they can type **M** to move again.
- Players must select a room that is adjacent to a room that already has a Moppet in it. If they select a room that does not adjoin another Moppet's room or a room that already has a Moppet in it, they will see a message instructing them to press **RETURN** and choose another room.
- After pressing **SPACEBAR**, players describe a Moppet for that room by selecting a trait from each of the four pairs of Moppet traits.
- Players can change the traits of their Moppet if they press the backspace (**←**) key before they have entered all four traits. (Use **DELETE/BACK S** for Atari).

## **Moptown Map**

- Each Moppet can be used only once. If a player enters the traits for a Moppet already in the hotel, the player will see the message THAT MOPPET ALREADY HAS A ROOM. PRESS <RETURN> AND TRY ANOTHER ONE.
- If a player enters the traits for a Moppet that does not fit the rules, play moves to the other player.
- To pass a turn, players press **P**.
- If a player thinks that there are no more possible moves, that player can press **S** to stop the game. The question DO BOTH PLAYERS WANT TO STOP? (TYPE Y OR N) will appear on the screen. If the answer is no, play moves to the next player. If the answer is yes, the screen will display the score for both players and ask if they want to play again.
- Note that if a player presses **S** accidentally during the game, that player can lose a turn.

To earn more points, players should try to place a Moppet in a room that adjoins two or more other Moppets' rooms. If the two players fill the hotel, which is not always possible, they will both earn bonus points. When the game is over, either because players have filled the hotel or because they have pressed **S** to stop the game, they will see their scores displayed on the screen. Then they will have to answer the question PLAY AGAIN? (Y OR N). If they press **Y** for yes to play again, the hotel will be cleared, but the rules and the players' names and scores will carry over to the next game (players can change the rules if they want). If players press **N** for no, they will return to the menu.

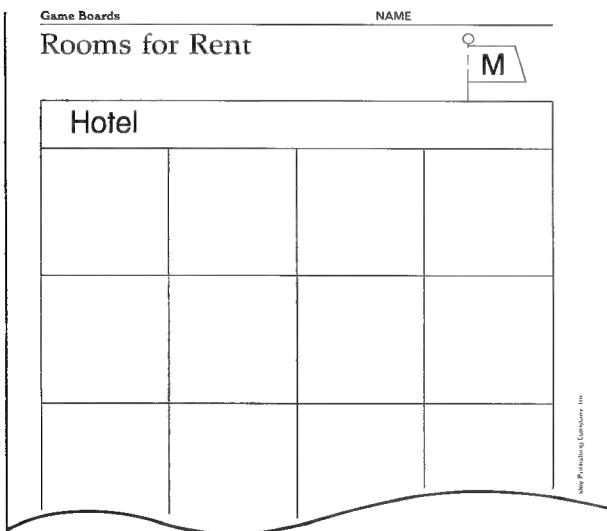
Once students understand the game, they can take turns playing it at the computer. The rest of the class can be involved in the off-line activities that follow.

## **Off-Line Activities**

**GAME BOARDS** Students play these two-player or two-team games, much like they play the computer game, by placing Moppet cards or shape cards on the game boards according to row and column rules that are on the boards or that are determined by the players. They earn points according to the difficulty of the moves they make.

You need:

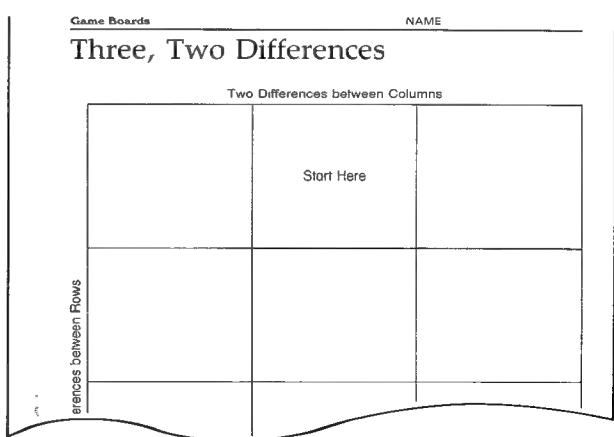
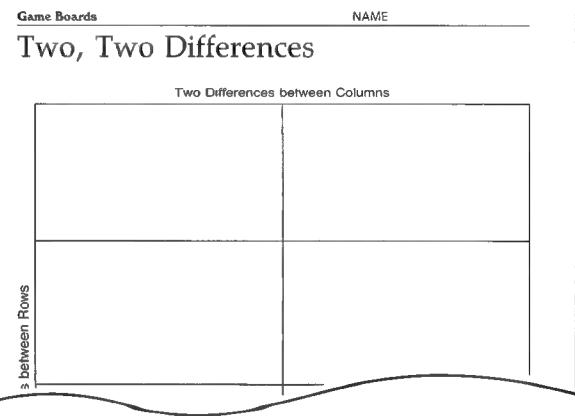
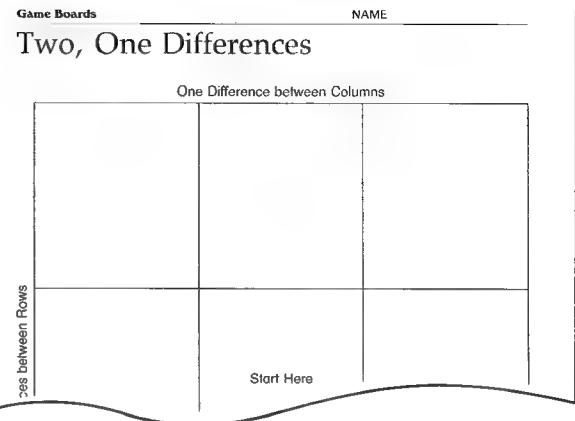
- A game board (page 36, 37, 38, or 39) for each group playing the game.
- A set of Moppet cards or shape cards (page 3 or 5) for each group playing the game.
- Play \$10 and \$20 bills (optional).



Students can play the games with the Moppet or shape cards which they have colored and cut apart.

To play:

- Players select a game board, and if they do not use the Hotel game board, they decide whether to play with Moppet cards or shape cards.
- If players are using the Hotel game board on page 36, they must first select the row and column rules for the game and write them on the activity sheet.
- The teacher randomly selects one Moppet or shape card and places it on the game board.
- Players flip a coin to see who goes first.



## Moptown Map

- Players take turns placing Muppet cards or shape cards on the game board according to the rules. They are awarded points (or dollar amounts when playing with the Hotel game board) as follows:
  - 1 point (\$10) for placing a card next to one other card
  - 2 points (\$20) for placing a card next to two other cards
  - 3 points (\$30) for placing a card next to three other cards
- When no more cards can be placed on the board according to the prevailing rules, the game is over.

To win:

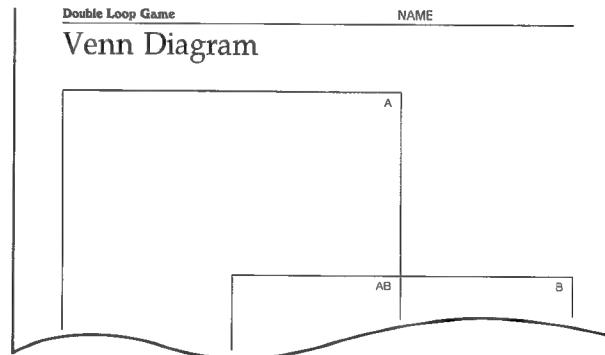
- The player with the most points or money at the end of the game wins and makes the first play for the next game.

**DOUBLE LOOP GAME** In this two-player or two-team game, students sort Muppet cards or shape cards using Venn diagrams.

You need:

- A game board (page 40) for each group playing the game.
- A set of Muppet cards or shape cards (page 3 or 5) for each group playing the game.

Students can play the game with the Muppet or shape cards which they have colored and cut apart.



To play:

- Players decide whether to play with Muppet cards or shape cards.
- The teacher (or another student) acts as the "Rule Master," selecting rules for the A loop and the B loop and placing two cards in each of those loops according to the secret rules.
- The players or teams take turns selecting a card and trying to place it in the A loop, the B loop, or the AB loop (in which cards must satisfy *both* of the rules.) The Rule Master tells the player whether or not the card can stay in that loop.
- Players receive one point for each card that they correctly place in a loop.

- If a player (or team) thinks that no more cards will go into any of the loops, that player says, "zero." If correct, the Rule Master awards that player an additional point and declares the game over. If incorrect, the Rule Master deducts one point from that player's score and the game continues.

To win:

- The player with the most points at the end of the game wins and may act as the Rule Master for the next game. (In team play, the winning team selects one of its players to be Rule Master.)

Note that if a card satisfies both of the rules for the A and B loops, it should be placed in the AB loop, which is the intersection of the two loops. If the rules for the A and B loops are for the same kind of trait, the AB loop will be empty. For example, if the A loop has the rule *red* and the B loop has the rule *blue*, no cards will go in the AB loop because none of the cards can be *red and blue*. Note, also, that for both Moppet cards and shape cards, some of the cards will not go into any of the loops.

# **Evaluation**

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Activity sheets may be selected for written evaluation of the objectives learned. In addition, many teachers find that oral evaluation, while students are in front of the computer or looking at an activity sheet, is a quick and effective method. Some suggested questions and instructions are given for each game.

## **1 Who's Next Door?**

- Describe the Moppets that you see in the green and yellow boxes.
- How are the Moppets in the green boxes alike?
- How are they different?
- What do you think goes in the second yellow box?
- In how many ways does the Moppet in the second yellow box differ from the one in the first yellow box?

## **2 Change Me**

- What is the rule?
- In how many ways should you change the Moppet in box #1 to fit in box #2?
- Why is it important to look at the Moppet in box #1 and the Moppet in box #4?

## **3 Spot Me**

- How many Moppets are tall?
- How many are short?
- How many Moppets are red?
- How many are blue?
- How many Moppets are fat?
- How many are thin?
- How many of the Moppets are Bibbits?
- How many are Gribbits?
- Which Moppet has a special trait?

#### **4 Whose Birthday?**

- Which Moppet did you choose first?
- What did you find out about your choice?
- Then which Moppet did you choose?
- Why did you choose that Moppet?

#### **5 Secret Pal**

- Which trait did you choose first? second? third? last?
- Which trait(s) did you change first?
- Did you change more than one trait at a time?
- What did you find out about your method of changing traits?
- Is it a good idea to change more than one trait at a time?

#### **6 Moptown Map**

- How many rules does each row have? each column?
- Which house did you go to first?
- Why did you place that Moppet there?
- How many traits did you change the first time around?
- How many traits do you think you should change each time?
- Why is it important to notice *both* the row and the column?

#### **7 Moptown Hotel**

- How many traits must differ between rooms on the same floor?
- How many traits must differ between floors?
- Which room did you go to first?
- Why did you place that Moppet there?
- Where did you go next? Why?
- How many traits did you change each time?

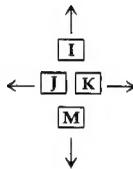
## Special Keys

**ESC** Press **ESC** to stop a game before it ends. When you see DO YOU WANT TO STOP? (Y Or N), type *y* for *yes* or *n* for *no*. If you type *y*, you will return to the menu where you can stop or choose another game. If you type *n*, you will return to the game.

**SHIFT** – **?** Press **SHIFT** with **?** to return to the instructions.

**RETURN** Press **RETURN** only when asked.

**←** Press **←** to erase when entering the four traits that describe a Moppet.

 In some games, the **I**, **J**, **K** and **M** keys are used to move a cursor (small white square).  
The cursor moves in the direction of the arrows. When it reaches an edge, it will "wrap around" to the opposite edge.

**SPACEBAR** Press **SPACEBAR** to enter a Moppet after moving with **I**, **J**, **K** and **M**.

**P** Press **P** to pass (skip your turn). Play passes to the other player.

**S** Press **S** to stop. It is not always possible to fill all the rooms. When you have filled all that you can, pressing **S** will allow you to stop and see your final score. Both players must be willing to stop, however.

**Remember** to press **SPACEBAR** after you have selected a room, and before you have selected a Moppet.

## **Keeping Current**

The following publications and organizations are intended to provide additional information to educators who want to learn more about computers and their use as an educational tool. Each book, magazine and national organization is recommended by several educators and specialists in computer instruction. And, each resource is available nationally. Subjects included range in content from technical issues addressed in the industry to applications of the computer in the classroom and to prominent organizations that will further stimulate and inform computer users. We hope that **Keeping Current** will help keep you up to date.

### **Books**

Coburn, et al. *Practical Guide to Computers in Education*. Massachusetts: Addison-Wesley, 1982.

Goodson, Bobby, and Ann Lathrop. *Courseware in the Classroom*. Massachusetts: Addison-Wesley, 1983.

Hunter, Beverly. *My Students Use Computers: Computer Literacy in K-8 Curriculum*. Virginia: Reston, 1983.

Kleiman, Glenn. *Brave New Schools: How Computers Can Change Education*. Virginia: Reston/Prentice Hall, 1984.

Papert, Seymour. *Mindstorms*. New York: Basic Books, 1980.

Peterson, Dale, ed. *Intelligent Schoolhouse: Readings on Computers in Learning*. Virginia: Reston/Prentice Hall, 1983.

### **Magazines**

*Classroom Computer Learning*. Pitman Learning Co., 5615 W. Cermak Road, Cicero, Illinois 60550

*Compute*. P.O. Box 914, Farmingdale, New York 11737

*Digest of Software Reviews*. Educational Computing Magazine, 301 W. Mesa, Fresno, California 93704

*Electronic Learning Magazine*. Scholastic Inc., P.O. Box 644, Lyndhurst, New Jersey 07071-9985

*Teaching and Computers*. Electronic Learning, 902 Sylvan Avenue, Englewood Cliffs, New Jersey 07632

*The Computing Teacher*. University of Oregon, 1787 Agate Street, Eugene, Oregon 97403-1923

### **Organizations**

International Council for Computers in Education (ICCE). Department of Computer and Information Science, University of Oregon, Eugene, Oregon 97403

Computer-Using Educators (CUE). P.O. Box 18547, San Jose, California 95158

Minnesota Educational Computing Consortium (MECC). 2520 N. Broadway Drive, St. Paul, Minnesota 55113

## Glossary

**Analyze** To describe the nature of an object by separating it into its parts.

**Attribute** A specific characteristic of an object.

**Classify** To put into groups according to specific attributes.

**Constant** A characteristic that remains the same under specified conditions.

**Deduction** To reason from the general to the particular.

**Logic** The science of using valid principals of reasoning and inference, both inductive and deductive.

**Order** To put in a specific type of sequence.

**Rule** The controlling order of a particular grouping of information.

**Trait** A distinguishing feature or characteristic.